TEST DRILLING EQUIPMENT & PROCEDURES

Drilling Equipment Truck-mounted CME-55 drill rigs powered with 4 or 6 cylinder Ford industrial engines are used in advancing test borings. The 4 cylinder and 6 cylinder engines are capable of delivering about 4,350 and 6,500 foot/pounds torque to the drill spindle, respectively. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock is performed with 6 1/2 O.D., 3 1/4 I.D. hollow stem auger or 4 1/2 inch continuous flight auger. Carbide insert teeth are normally used on the auger bits so they can often penetrate rock or very strongly cemented soils which require blasting or very heavy equipment for excavation. Where refusal is experienced in auger drilling, the holes are sometimes advanced with tricone gear bits and NX rods using water or air as a drilling fluid. Where auger and tricone gear bits cannot be used to advance the hole due to cobbles or caving conditions, the ODEX (overburden drilling with the eccentric method) is used. A percussion down-the-hole hammer underreams the hole and 5 inch steel casing is introduced into the hole during drilling. The drill bit is eccentric and can be removed from the center of the casing to allow sampling of the material below the bit penetration depth.

Sampling Procedures Dynamically driven tube samples are usually obtained at selected intervals in the borings by the ASTM D1586 procedure. In many cases, 2" O.D., 1 3/8" I.D. samplers are used to obtain the standard penetration resistance. "Undisturbed" samples of firmer soils are often obtained with 3" O.D. samplers lined with 2.42" I.D. brass rings. The driving energy is generally recorded as the number of blows of a 140 pound 30 inch free fall drop hammer required to advance the samplers in 6 inch increments. However, in stratified soils, driving resistance is sometimes recorded in 2 or 3 inch increments so that soil changes and the presence of scattered gravel or cemented layers can be readily detected and the realistic penetration values obtained for consideration in design. These values are expressed in blows per foot on the logs. "Undisturbed" sampling of softer soils is sometimes performed with thin walled Shelby tubes (ASTM D1587). Where samples of rock are required, they are obtained by NX diamond core drilling (ASTM D2113). Tube samples are labeled and placed in watertight containers to maintain field moisture contents for testing. When necessary for testing, larger bulk samples are taken from auger cuttings.

Continuous Penetration Tests Continuous penetration tests are performed by driving a 2" O.D. blunt nosed penetrometer adjacent to or in the bottom of borings. The penetrometer is attached to 1 5/8" O.D. drill rods to provide clearance to minimize side friction so that penetration values are as nearly as possible a measure of end resistance. Penetration values are recorded as the number of blows of a 140 pound 30 inch free fall drop hammer required to advance the penetrometer in one foot increments or less.

Boring Records Drilling operations are directed by our field engineer or geologist who examines soil recovery and prepares boring logs. Soils are visually classified in accordance with the Unified Soil Classification System (ASTM D2487) with appropriate group symbols being shown on the logs.

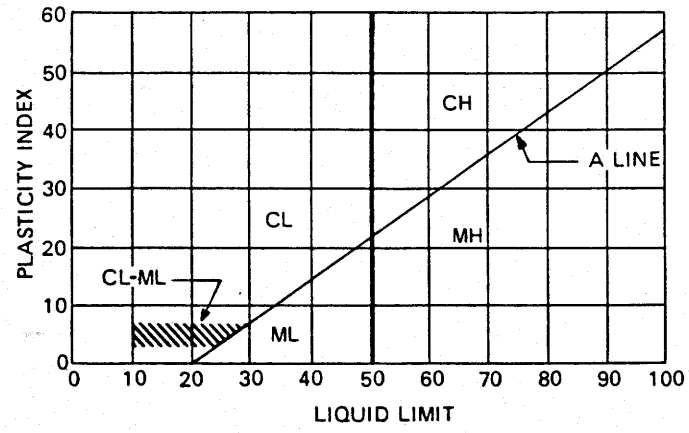
UNIFIED SOIL CLASSIFICATION SYSTEM

Soils are visually classified by the Unified Soil Classification system on the boring logs presented in this report. Grain-size analysis and Atterberg Limits Tests are often performed on selected samples to aid in classification. The classification system is briefly outlined on this chart. For a more detailed description of the system, see "The Unified Soil Classification System" Corp of Engineers, US Army Technical Memorandum No. 3-357 (Revised April 1960) or ASTM Designation: D2487-66T.

MAJOR DIVISIONS				GRAPHIC SYMBOL	GROUP SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (Less than 50% passes No. 200 sieve)	GRAVELS (50% or less of coarse fraction passes No. 4 sieve)	CLEAN GRAVELS (Less than 5% passes No. 200 sieve)			GW	Well graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
					GP	Poorly graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
		GRAVELS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart		GM	Silty gravels, gravel-sand-silt mixtures.
			Limits plot above "A" line & hatched zone on plasticity chart		GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction passes No. 4 sieve)	CLEAN SANDS (Less than 5% passes No. 200 seive)			SW	Well graded sands, gravelly sands.
					SP	Poorly graded sands, gravelly sands.
		SANDS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart		SM	Silty sands, sand-silt mixtures.
			Limits plot above "A" line & hatched zone on plasticity chart		SC	Clayey sands, sand-clay mixtures.
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS (Limits plot below "A" line & hatched zone on plasticity chart)	SILTS OF LOW PLASTICITY (Liquid Limit Less Than 50)			ML	Inorganic silts, clayey silts with slight plasticity.
		SILTS OF HIGH PLASTICITY (Liquid Limit More Than 50)			MH	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts.
	CLAYS (Limits plot above "A" line & hatched zone on plasticity chart)	CLAYS OF LOW PLASTICITY (Liquid Limit Less Than 50)			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		CLAYS OF HIGH PLASTICITY (Liquid Limit More Than 50)			CH	Inorganic clays of high plasticity, fat clays, sandy clays of high plasticity.

NOTE: Coarse grained soils with between 5% & 12% passing the No. 200 sieve and fine grained soils with limits plotting in the hatched zone on the plasticity chart to have double symbol.

PLASTICITY CHART



DEFINITIONS OF SOIL FRACTIONS

SOIL COMPONENT	PARTICLE SIZE RANGE
Cobbles	Above 3 in.
Gravel	3 in. to No. 4 sieve
Coarse gravel	3 in. to ¾ in.
Fine gravel	¾ in. to No. 4 sieve
Sand	No. 4 to No. 200
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines (silt or clay)	Below No. 200 sieve

TERMINOLOGY USED TO DESCRIBE THE RELATIVE DENSITY, CONSISTENCY OR FIRMNESS OF SOILS

The terminology used on the boring logs to describe the relative density, consistency or firmness of soils relative to the standard penetration resistance is presented below. The standard penetration resistance (N) in blows per foot is obtained by the ASTM D1586 procedure using 2" O.D., 1 3/8" I.D. samplers.

1. Relative Density. Terms for description of relative density of cohesionless, uncemented sands and sand-gravel mixtures.

N	Relative Density
0-4	Very loose
5-10	Loose
11-30	Medium dense
31-50	Dense
50+	Very dense

2. Relative Consistency. Terms for description of clays which are saturated or near saturation.

N	Relative Consistency	Remarks
0-2	Very soft	Easily penetrated several inches with fist.
3-4	Soft	Easily penetrated several inches with thumb.
5-8	Medium Stiff	Can be penetrated sev- inches with thumb with moderate effort.
9-15	Stiff	Readily indented with thumb, but penetrated only with great effort.
16-30	Very stiff	Readily indented with thumbnail.
30+	Hard	Indented only with difficulty by thumbnail.

3. Relative Firmness. Terms for description of partially saturated and/or cemented soils which commonly occur in the Southwest including clays, cemented granular materials, silts and silty and clayey granular soils.

N	Relative Firmness
0-4	Very soft
5-8	Soft
9-15	Moderately firm
16-30	Firm
31-50	Very Firm
50+	Hard

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LOG OF TEST BORING NO. C-1

JOB NO. E85-2011J DATE 8-7 & 9-24-85

location N16045, E15260
RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 5429.5'
DATUM MSL

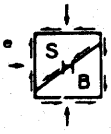
Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								GC	slightly moist very firm	FILL CLAYEY SAND & GRAVEL, some cobbles & possible boulders, angular to subangular, low plasticity, brown grading to dark olive green
				S	35					
5				S	13		16			
10				S	13				moist moderately firm to firm	FILL CLAYEY SAND, considerable subangular gravel, predominantly medium to fine grained, medium plasticity, olive green to rusty brown at 25' note: railroad ties at 26'
15				S	14			SC & GC		
20				S	25		15			
25				S	19					
30				S	17			SM	very moist to saturated firm	FILL SILTY SAND & GRAVEL, considerable clay, predominantly coarse to fine grained, low plasticity, dark brown to black
				T						
35				S	41		19	GC		
40				S	50/4½"				saturated very firm	FILL CLAYEY GRAVEL & SAND, predominantly coarse to fine grained, subrounded, low to medium plasticity, reddish brown note: trace of railroad ties at 35'
45				S	50/4"		16			
50				S	50/½"					

GROUND WATER

DEPTH	HOUR	DATE
26'	10:30a	8-8
27'	11:10a	9-24

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.



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LOG OF TEST BORING NO. C-1

JOB NO. E84-2011J DATE 8-7 & 9-24-85

location N16045, E15260

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 5429.5'

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
									moist	Tvb LATITE BRECCIA containing boulders, cobbles & gravel of latite, quartz, monzonite, andesite & related intrusive rocks, flows & tuffs, limestone & quartzite in fine grained volcanic groundmass, highly weathered to moderately weathered, massive, occasional thick beds, moderately hard to very soft, white to greenish gray, forming low to medium plasticity SAND, CLAYEY SILT note: apparent bedrock contact at 40'
										Stopped auger at 50' Sampler refused at 50'½" note: hole caved to 26'3" on 9-26-85

GROUND WATER

DEPTH	HOUR	DATE

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

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LOG OF TEST BORING NO. C-2

JOB NO. E84-2011J DATE 8-7 & 9-24-85

location N16347, E15460±

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 5450'±

DATUM MSL

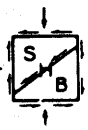
Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0									slightly moist	FILL BLACK SLAG
			S	25						
5			S	25			12	SC	moist firm	FILL CLAYEY SAND & GRAVEL, some silt, predominantly medium to fine grained, subangular to subrounded, high plasticity, yellowish olive brown
10			S	32				SM	moist very firm	FILL SILTY SAND, some gravel & clay, predominantly medium to fine grained, low plasticity to non-plastic, rusty brown note: some 2" to 4" thick lenses of dark brown medium plasticity clay
15			S	14			17	CL		
20			S	80			8	GM		
25			S	40			8		moist moderately firm	FILL SANDY CLAY, some sub-angular gravel, low to medium plasticity, brown
30			S	33			11		moist hard	FILL SILTY GRAVEL, consider-able sand, trace of cobbles, subangular, nonplastic, brown
35			S	50/5"				GC-GM	moist very firm to hard	CLAYEY GRAVEL, consider-able sand, some cobbles, subangular to subrounded, low plasticity, brown note: apparent decrease in clay content from 40' to 48' note: color change to grayish brown at 50' *hole caved to 48'
40			S	50/5"			10			
45			S	50/4"						
50										

GROUND WATER

DEPTH	HOUR	DATE
50'	2:20p	9-24
*none		9-26

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.



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LOG OF TEST BORING NO. C-2

JOB NO. E84-2011J DATE 8-7 & 9-24-85

location N16347, E15460±

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 5450'±

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
50			X	S	42		9	GC-GM		
55										Stopped auger at 50' Stopped sampler at 51'6" note: boring was offset 76' to the northwest of the staked location

GROUND WATER

DEPTH	HOUR	DATE

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

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LOG OF TEST BORING NO. C-3

JOB NO. E84-2011J DATE 8-7 & 9-24-85

location N16438, E15615

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 5453.9'

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0									moist firm	FILL CLAYEY SAND, considerable subangular gravel, predominantly medium to fine grained, high plasticity, olive brown & green note: encountered buried ground wire at 2'
								SC		
5			X	S	28		12			
10			X	S	11				moist to saturated very soft to moderately firm	SILTY SAND, trace of clay, predominantly medium to fine grained, nonplastic, olive brown grading to gray at 20' note: considerable clay at 15'
15			X	S	9		27			
			X	T	(no recovery)			SM		
20			X	S	10		27			
25			X	S	2		36			
30			X	S	8				saturated soft	SANDY SILT, some fine grained gravel, predominantly fine grained sand, low plasticity, olive brown
								CL-ML		
35			X	S	8		22			
40			X	S	63				saturated very firm to hard	SILTY GRAVEL, considerable coarse to fine grained sand, subrounded, nonplastic, reddish brown & yellowish brown
								GM		
45			X	S	40		10			
50										

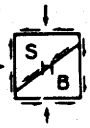
*18' 1:30p 8-7
16' 4:00p 9-24
9'8" 9:30a 9-26

GROUND WATER

DEPTH	HOUR	DATE
*		

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.



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JOB NO. E84-2011J DATE 8-7-85

LOG OF TEST BORING NO. C-3

location N16438, E15615

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 5453.9'

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
50			X	S	23		12			
								GM		
55			X	S	66					
60										Stopped auger at 55' Stopped sampler at 56'6"

GROUND WATER

DEPTH	HOUR	DATE

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

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JOB NO. E84-2011J DATE 8-7-85

LOG OF TEST BORING NO. C-4

location N16840, E15220±

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 5494'±

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				S	55		5		slightly moist firm to hard	FILL SILTY SAND & GRAVEL, considerable cobbles & possible boulders, coarse to fine grained, low plasticity, dark brown to black note: considerable boulders at surface note: located in dozer cut; dozer dug up concrete pipe, culverts, wire, cables, etc. note: metal cuttings at 6'
5				S	21			SM & GM		
10				S	49		14			
15				S	50/4"			SM		
20				S	50/2½"			GC	moist very firm to hard	SILTY SAND, predominantly fine grained, non-plastic, light olive brown note: silty sand & gravel lens at 15' to 16' note: thin 1" to 2" thick clay lenses from 9' to 12'6"
25									moist hard	CLAYEY GRAVEL, some sand & cobbles, subangular to subrounded, low plasticity, dark brown to brown
										Stopped auger at 20' Sampler refused at 20'2½"

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

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JOB NO. E84-2011J DATE 8-8-85

LOG OF TEST BORING NO. C-5

location N17006, E15156

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 5499.6'

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								SM	slightly moist	SILTY SAND, predominantly medium to fine grained, nonplastic, brown
				S	34			CL	moderately firm	note: asphalt at surface
				S	64		2	GM		
5				S	39					
								CL	slightly moist	SILTY CLAY, some sand, moderately lime cemented, medium plasticity, dark brown
10				S	50/5" (no recovery)				very firm	
								GM & SM	slightly moist	SILTY GRAVEL & SAND, considerable cobbles, trace of clay, predominantly coarse to fine grained, subangular to subrounded, nonplastic, grayish brown
15				S	71		8		hard	note: silty sand lens from 5' to 5'6"
20				S	50/5"				slightly moist	SANDY CLAY, considerable silt, medium plasticity, brown
									very firm	
25									moist to very moist	SILTY GRAVEL & SAND, considerable cobbles, trace of clay, predominantly coarse to fine grained, subangular to subrounded, nonplastic, brown
									hard	note: decreased cobble content with depth
										Stopped auger at 20' Sampler refused at 20'11"

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

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JOB NO. E84-2011J DATE 8-8-85

LOG OF TEST BORING NO. C-6

location N17779, E14530

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 5609.8'

DATUM MSL

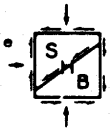
Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				S	29		9	CH	slightly moist firm to very firm	SILTY CLAY, considerable sand, some fine grained gravel, moderately lime cemented, high plasticity, dark brown to tan & reddish brown note: organics to 6"
				S	34					
5				S	65					
10				S	71		25	GW-GM	slightly moist to moist very firm to hard	SILTY GRAVEL & SAND, some cobbles, trace of clay, predominantly coarse to fine grained, subangular to subrounded, nonplastic, yellowish brown & grayish brown note: some 2" to 3" thick clay lenses
15				S	42					
20				S	27		14	SC	moist firm	CLAYEY SAND, some subrounded gravel, predominantly coarse to fine grained, medium plasticity, brown
25										Stopped auger at 20' Stopped sampler at 21'6"

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.



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LOG OF TEST BORING NO. C-7

JOB NO. E84-2011J DATE 8-8-85

location N20850, E15230±

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 5828'±

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				S	50/4"			CL	slightly moist hard	SANDY CLAY, considerable cobbles & boulders, moderately lime cemented, medium plasticity, dark brown
				S	37		30			
5				S	101				very moist to moist very firm to hard	CLAYEY GRAVEL & SAND grading to SILTY GRAVEL & SAND, occasional cobbles, predominantly coarse to fine grained, subangular, weakly lime cemented, low plasticity to nonplastic, brown with multicolored igneous gravels
								GW-GC		
10				S	50/2"					
15				S	50/3"				moist hard	SILTY SAND, some gravel, predominantly coarse to medium grained, sub-rounded, nonplastic, olive green note: appears to be weathered bedrock horizon; transition zone to hard bedrock from 13' to 21'6"
								SM & GM		
20				S	50/2"					
25										Auger refused at 23'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

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PROJECT Kennecott Conveyor

JOB NO. E84-2011J DATE 8-8-85

LOG OF TEST BORING NO. C-8

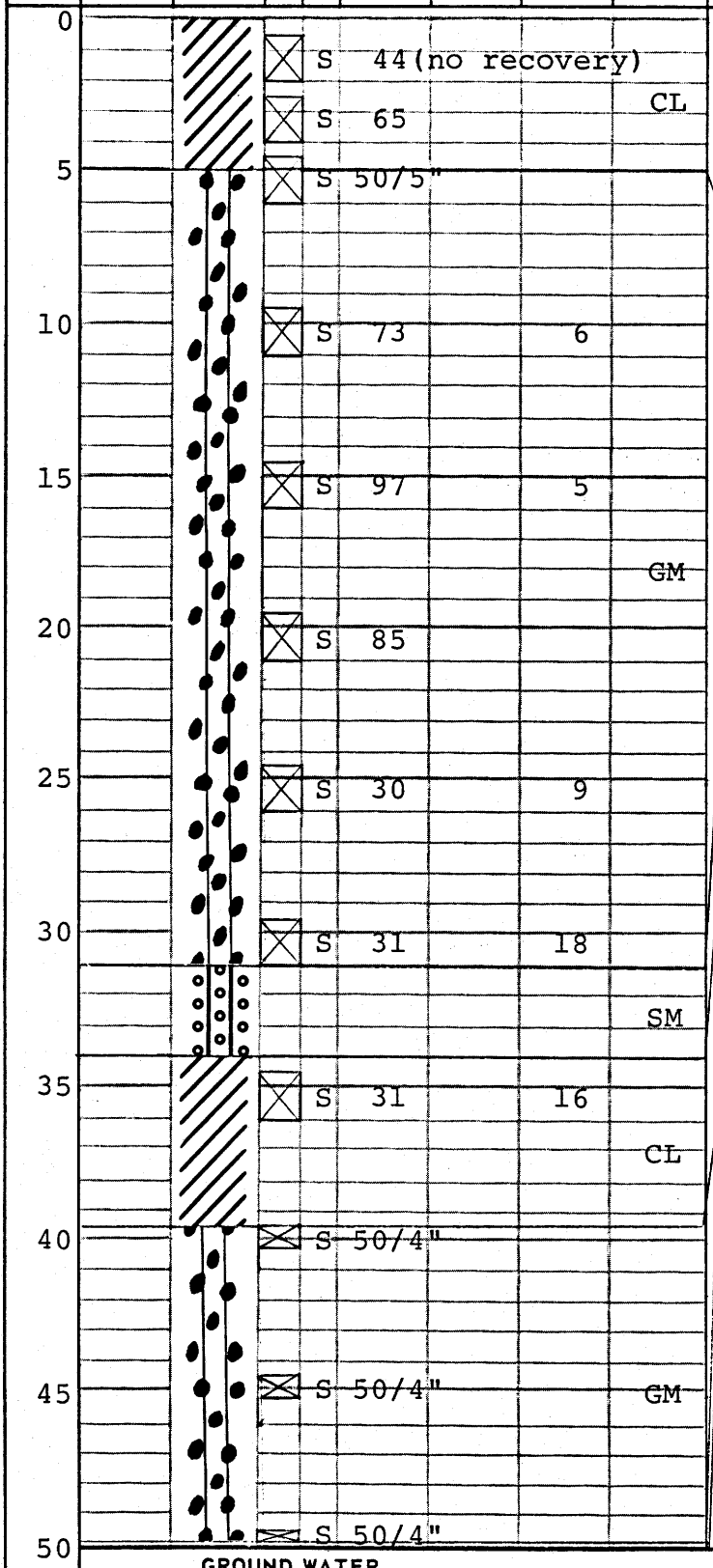
location N23170, E15760±

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 5670'±

DATUM MSL



REMARKS	VISUAL CLASSIFICATION
slightly moist very firm to hard	SILTY CLAY, some sand, gravel, cobbles & surface boulders, moderately lime cemented, medium plasticity, tan & light brown
slightly moist to very moist firm to hard	SILTY GRAVEL & SAND, some cobbles, trace of clay, predominantly fine grained gravel, predominantly coarse to fine grained sand, subangular to subrounded, nonplastic, yellowish brown note: increase in clay content from 23' to 26'
moist firm	SILTY SAND, some clay, predominantly fine grained, nonplastic, light brown
moist very firm	SANDY CLAY, trace of fine grained gravel, predominantly fine grained sand, weakly lime cemented, low plasticity, tan
moist hard	SILTY GRAVEL & SAND, trace of clay, preominantly coarse to fine grained, subrounded, nonplastic, yellowish brown
	Stopped auger at 49'6" Sampler refused at 49'10" note: boring offset 37' north of staked location due to access difficulties

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

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JOB NO. E84-2011J DATE 8-8-85

LOG OF TEST BORING NO. C-9

location N23820, E15910

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 5781'±

DATUM MSL

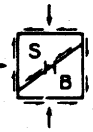
Depth in Feet	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0	☒	S	22			slightly moist to moist	SILTY CLAY, considerable sand, some cobbles & gravel, weakly lime cemented, medium plasticity, dark brown to tan
	☒	T			CL		
5	☒	S	36	22		firm to very firm	
10	☒	S	41			moist	SILTY SAND, considerable gravel, some clay, predominantly fine grained gravel, predominantly coarse to fine grained sand, nonplastic, grayish brown
						firm to hard	
15	☒	S	28				note: encountered cobbles & possible boulders at 22'6" to 25' & 30'
20	☒	S	60	6	SM		
25	☒	S	37				
30	☒	S	50/5"				
35							Stopped auger at 30' Sampler refused at 30'11"

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.



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